

To: CN=Alice Gilliland/OU=CI/O=USEPA/C=US@EPA[]
Cc: []
Bcc: []
From: CN=Cynthia Sonich-Mullin/OU=CI/O=USEPA/C=US
Sent: Tue 10/23/2012 4:48:50 PM
Subject: Fw: Pavillion just came across this.... read the highlighted section

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Cynthia Sonich-Mullin
Director
National Risk Management Research Laboratory
Cincinnati, Ohio 45268
Ofc: 513-569-7923
Cell: 513-560-5043

----- Forwarded by Cynthia Sonich-Mullin/CI/USEPA/US on 10/23/2012 12:47 PM -----

From: Dayna Gibbons/DC/USEPA/US
To: Ramona Trovato/DC/USEPA/US@EPA, Cynthia Sonich-Mullin/CI/USEPA/US@EPA
Cc: Jose Zambrana/DC/USEPA/US@EPA
Date: 10/23/2012 11:47 AM
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Dayna Gibbons
Communications
Office of Research and Development
202-564-7983
gibbons.dayna@epa.gov

----- Forwarded by Dayna Gibbons/DC/USEPA/US on 10/23/2012 11:46 AM -----

From: Dayna Gibbons/DC/USEPA/US
To: Elizabeth Blackburn/DC/USEPA/US@EPA
Date: 10/23/2012 11:26 AM
Subject: just came across this.... read the highlighted section

<http://www.energyindepth.org/enormous-differences-between-epas-pavillion-data-and-usgss/>

UPDATE Enormous Differences between USGS and EPA on Pavillion
Tuesday, October 16th, 2012 | 1 Comment | Tagged in: Encana, EPA, Hydraulic fracturing, Pavillion,
shale, USGS, Water, Wyoming
15 13 5 2
Simon
Research Director

UPDATE | (12:38 p.m. ET) – The EPA was back in damage-control mode last week after a public hearing

on the Pavillion case brought to light some truly embarrassing mistakes by the agency. Going into the Oct. 10 meeting in Riverton, Wyoming, it was already known that the EPA had ignored expert advice and technical standards from other federal agencies – the U.S. Geological Survey and the U.S. Bureau of Land Management – and the State of Wyoming. But during last week's meeting of the Pavillion Working Group, it was revealed EPA officials had also breached the agency's own rules for drilling groundwater monitoring wells.

How do we know this? In part, because officials with the Wyoming Department of Environmental Quality actually took a video camera and lowered it into one of the EPA's monitoring wells to see what's been going on.

According to the findings of DEQ's "down-hole camera" investigation, the EPA falsely claimed to have used stainless steel casing for one of the two monitoring wells, MW02, when it released its December 2011 draft Pavillion report. In fact, the casing was made of carbon steel. Why is this a problem for a monitoring well that was built to detect the presence of chemicals in groundwater? Let's consult the EPA's "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells":

"The presence of corrosion products represents a high potential for the alteration of ground-water sample chemical quality. The surfaces on which corrosion occurs also present potential sites for a variety of chemical reactions and adsorption. These surface interactions can cause significant changes in dissolved metal or organic compounds in ground water samples ...

On the basis of these observations, the use of carbon steel, low-carbon steel and galvanized steel in monitoring well construction is not considered prudent in most natural geochemical environments. Conversely, stainless steel performs well in most corrosive environments, particularly under oxidizing conditions." p. 79

So, were any "corrosion products" found inside MW02? Yes, according to the Wyoming DEQ's findings:

"Mineral accumulation within the well indicates the well casing was not constructed of stainless steel as originally reported by EPA. This has been confirmed by EPA." p. 20

From there, the EPA's mistakes just keep piling up. The EPA said in December that MW02 was drilled to a depth of 980 feet, and below the bottom of the well were 17 feet of cuttings and leftover drilling mud. But DEQ's investigation found the well is actually 989 feet deep. Why is that a problem? Because there's a special screened section at the bottom of the well, where water samples are taken, and it now appears to be covered with drilling mud and cuttings. For water to seep into the bottom of the well, it must first move through the drilling mud and cuttings, and the water picks up some contaminants along the way. Once again, according to the EPA's monitoring-well handbook:

"Monitoring well installation procedures can also have a significant impact on the integrity of ground-water samples. For example, Brobst and Buszka (1986) found that organic drilling fluids and bentonite drilling muds used in mud rotary drilling can have an effect on the chemical oxygen demand of ground water adjacent to the wellbore in a rotary-drilled well. This, in turn, can affect the quality of a water sample taken from such a well, resulting in the acquisition of non-representative ground-water samples." p. 7

"...drilling fluid tends to infiltrate permeable zones and tends to interact chemically with the formation fluids. This is why the mud must be removed during the development process. This chemical interaction can interfere with the specific function of a monitoring well and prevent collection of a sample that is representative of the in-situ ground-water quality." p. 41

All the drilling mud and cuttings at the bottom of the well can lead to blockages in the screened section of the well, reducing the flow of water. In fact, when USGS officials went to Pavillion to check EPA's work, they refused to take groundwater-quality samples from MW02 because of the low flow rate. This photo from DEQ's down-hole camera investigation actually shows clogging of MW02's screened section:

DEQ geologist Nicole Twing, who presented the findings of the down-hole camera investigation at last week's hearing, explained the importance of MW02's flow rate in an interview with EID:

"You have low flow rates that increase the time water is in contact with those drilling materials, and materials used in drilling mud can affect groundwater quality. You don't know if it's biasing the results up or down."

So, in everyday terms, the water at the bottom of MW02 appears to be both stagnant and contaminated by the very materials that EPA used to build the monitoring well. That means any water samples taken from the well would not be representative of the water outside the well, which isn't stagnant and hasn't been contaminated by EPA's drilling materials.

In case you're curious what those materials might look like, DEQ also had cameras at the surface when some of that stuff was collected from the well:

But don't think the problems discussed at last week's hearing were limited to MW02. We're told USGS officials caused their EPA counterparts some heartburn by pointing out the potential for contamination from drilling materials in MW01. It's evident from this USGS graph, which shows pH levels falling as water was pumped out of MW01, allowing fresh groundwater to seep into the well and collect at the bottom:

The trend in this graph shows something that the EPA will have a tough time explaining when its draft Pavillion report finally goes into peer-review. It shows that the chemical properties of the fresh water outside MW01 are different than the chemical properties of the water collected inside MW01. Or, put another way, something about the monitoring well itself may be contaminating the fresh water as it seeps into the well.

So, when confronted with all this criticism about MW01 and MW02 – the agency's only two monitoring wells in Pavillion – how did EPA respond? By releasing more test results from both wells, pushing back the peer review process by another three months, and repeating its claim that the EPA's data is "generally consistent" with data from USGS.

Based on a preliminary examination of the latest EPA data, the EID team would like to close with a couple of observations about the "generally consistent" statement. First, when the EPA has a two-well monitoring program, and experts from the USGS refuse to take samples from one of those wells because it can't produce a reliable sample, you are left with a one-well monitoring program. That's not generally consistent. Second, when the EPA releases a new batch of test results, and finds chemicals that the USGS did not even detect – such as acetone, isopropanol, and formate – that's not generally consistent, either.

But, when you think about it, attention to detail probably isn't all that important to EPA officials who disregard their own guidelines for drilling monitoring wells when they go out and drill monitoring wells.

—Original post, October 3, 2012—

To rational observers, it's been clear for months that the EPA blundered in Pavillion, Wyoming, and blundered badly. But if you needed more evidence of the EPA's missteps, and the agency's desperation to save face, it came last week from an unexpected source: the federal government itself.

To recap, the EPA issued a preliminary report in December which, according to the Associated Press, "theorized a link between a petroleum industry practice called hydraulic fracturing and groundwater pollution in a Wyoming gas field." That theory came under fire almost immediately, after the State of Wyoming, EID, and many others identified serious flaws in the data EPA used to support it. For example, EPA's two groundwater monitoring wells were drilled too deep and into a natural hydrocarbon reservoir. There are also special procedures for drilling monitoring wells, but EPA didn't follow them, which means the agency may have introduced foreign substances into the very groundwater it was trying to sample.

When confronted with these flaws, and others, the EPA agreed in March to suspend its investigation, retest the wells, and bring in the U.S. Geological Survey to conduct its own sampling. Under one condition: that USGS could not provide any analysis of the data it collected. Instead, the role of USGS was limited to feeding raw data into the peer-review of EPA's findings, which has not yet begun.

The USGS published that raw data Sept. 26. Almost immediately, an EPA spokeswoman e-mailed reporters to say the USGS report "is generally consistent with groundwater monitoring data previously released by the Environmental Protection Agency." USGS couldn't say much in reply, other than "USGS did not interpret the data."

But for those willing to look closely enough at the USGS report, it's hard to see how the EPA can claim the two reports are "generally consistent." Actually, that statement is highly misleading, because there are glaring inconsistencies between what the EPA and USGS found. So far, Energy In Depth has identified more than 50 individual measurements from the EPA's draft Pavillion report that have been discredited by the USGS. Below, we pull just one of the tables from the draft report and highlight several of those inconsistencies, with the help of an Encana analysis and our own review of the USGS report:

Forty of the measurements, shaded red, were discredited by USGS because EPA's second monitoring well, MW02, was built so poorly that USGS refused to take groundwater quality samples from it. You read that right: USGS flat refused. In eight cases, shaded orange, substances measured by the EPA were not detected by the USGS. And in six cases, shaded blue, the USGS found significantly lower levels than EPA detected. Generally consistent? Hardly.

But it turns out USGS isn't the only federal agency to take EPA to task over Pavillion. According to E&E News (sub req'd): The drilling of the well has also been criticized by another federal agency, the Bureau of Land Management. In a newly surfaced document, BLM State Director Don Simpson criticized EPA's testing procedures in Pavillion as insufficient and called its findings "premature."

The letter was sent in March in response to EPA's draft Pavillion report, but wasn't posted on the official docket until July, and only came to the attention of reporters in recent days. Based on the following excerpts, the EID team is actually amazed this letter ever saw the light of day:

Bias in the samples obtained from these wells may exist. Possible causes include transfer of shallow contamination into deeper zones through the drilling process, or contamination of samples through the introduction of contamination during the drilling and well installation process...

In addition, the development of these monitor wells appears to be deficient for sampling purposes and groundwater samples from the wells should not be fully trusted until development activities indicate that the wells are yielding formation water untainted by any effects introduced by the drilling, well completion, and sampling process. ...

Only through careful drilling, installation and development can reliable samples of groundwater be obtained...

...observations have shown that large amounts of gas have been found in the shallow subsurface at certain locations.

These observations are anticipated and should not be prematurely used as a line of evidence that supports EPA's suggestion that

gas has migrated into the shallow subsurface due to hydraulic fracturing or improper well completion until more data is collected and analyzed...

So, to recap: we now have two federal agencies – USGS and BLM – that have joined the State of Wyoming, Encana and others in challenging the validity of EPA's testing in Pavillion. Put another way, there are more federal agencies criticizing the EPA's draft report than defending it. But don't worry: all that criticism is still "generally consistent" with the EPA's theories about hydraulic fracturing in Pavillion, right?

Tags: Encana, EPA, Hydraulic fracturing, Pavillion, shale, USGS, Water, Wyoming

One Response

Bernard Brennink says:

October 11, 2012 at 6:28 pm

Dear EID,

thanks for the good work that you do. I remain troubled by the fact that fracturing was occurring so close to the water table – is this truly responsible? What is the minimum separation in present and past legislation in Wyoming?

Reply

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Dayna Gibbons

Communications

Office of Research and Development

202-564-7983

gibbons.dayna@epa.gov